RESOLUTION A.518(13)

Superseded by A.602(15)

Adopted on 17 November 1983
Agenda item 10(b)

GUIDELINES FOR MARINE PORTABLE FIRE EXTINGUISHERS

THE ASSEMBLY,

RECALLING Article 16(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations concerning maritime safety,

RECOGNIZING that there is a need to supplement the requirements of chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, as amended, as well as chapter V of the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, with guidelines to assist Administrations in determining appropriate design and construction parameters for portable fire extinguishers referred to in those chapters,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its forty-eighth session:

1. ADOPTS the Guidelines for Marine Portable Fire Extinguishers the text of which is set out in the Annex to this resolution;

2. RECOMMENDS that all Governments concerned apply these Guidelines in conjunction with the appropriate requirements of the above instruments.

ANNEX

GUIDELINES FOR MARINE PORTABLE FIRE EXTINGUISHERS

1 SCOPE

1.1 These Guidelines have been developed to supplement the requirements for marine portable fire extinguishers* in the International Convention for the Safety of Life at Sea, 1974, and the Torremolinos International Convention for the Safety of Fishing Vessels, 1977. The Guidelines are offered to Administrations to assist them in determining appropriate design and construction parameters. The status of the Guidelines is advisory. Their content is based on current practices and does not exclude other designs and materials.

2 DEFINITIONS

2.1 An "extinguisher" is an appliance containing an extinguishing medium which can be expelled by the action of internal pressure and be directed into a fire. This pressure may be stored pressure or be obtained by a chemical reaction, or be obtained by release of gas from a cartridge.

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* Wherever in the text of these Guidelines the word "extinguisher" appears it shall be taken as meaning "marine portable fire extinguisher."

2.2 A "portable extinguisher" is one which is designed to be carried and operated by hand and which in working order has a total weight of not more than 23 kg.

2.3 "Extinguishing medium" is the substance contained in the extinguisher the action of which causes extinction of fire.

2.4 "Charge of an extinguisher" is the mass or volume of the extinguishing medium contained in the extinguisher. The quantity of the charge of water or foam extinguishers is normally expressed in volume (litres) and the quantity of charge of the other extinguishers in mass (kilograms).

3 CLASSIFICATION

3.1 Extinguishers are classified according to the type of extinguishing medium they contain. At present the types of extinguishers and their recommended use are as follows:

Extinguishing medium	Recommended for use on fires involving
Water	wood, paper, textiles, and similar materials
Foam	wood, paper, textiles, and flammable liquids
Dry powder/dry chemical (standard)	flammable liquids, electrical equipment, flammable gases
Dry powder/dry chemical (multiple or general purpose)	wood, paper, textiles, flammable liquids, electrical equipment, flammable gases
Dry powder/dry chemical (metal)	combustible metals
Carbon dioxide	flammable liquids, electrical equipment, flammable gases
Halons	flammable liquids, electrical equipment, flammable gases

A table is provided in the Annex which describes the general characteristics of each type of extinguisher.

4 CONSTRUCTION

4.1 The construction of an extinguisher should be designed and manufactured for simple and rapid operation, and ease of handling.

4.2 The body of the extinguisher as well as the hose and fittings should be of sufficient strength to withstand the maximum expected internal pressure. Consideration should be given to the temperature extremes which extinguishers may be exposed to on board ships, in the design of components, selection of materials and determination of maximum filling ratios and densities.

4.3 The materials of construction of exposed parts and adjoining dissimilar metals should be carefully selected to function properly in the marine environment.

5 FIRE CLASSIFICATIONS

5.1 Fire classifications are generally A, B, C and D. Currently there are no international definitions for these classifications. Two common definitions are as follows:

National Fire Protection Assoc. (NFPA)	Comité Européen de Normalisation (CEN)
A. Fires in ordinary combustible materials such as wood, cloth, paper, rubber and many plastics	A. Fires in solid materials, commonly of organic nature, the combustion of which generally produces embers
B. Fires in full flammable liquids, oils, greases, tars, oil based paints, lacquers, and flammable gases.	B. Fires in liquids or liquefiable solids
C. Fires which involve energized electrical equipment where the electrical non-conductivity of the extinguishing medium is of importance	C. Fires in gases
D. Fires in combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium	D. Fires in metals

6 TEST SPECIFICATIONS

6.1 Construction, performance and fire extinguishing test specifications should be to the satisfaction of the Administration.

7 CRITERIA FOR ASSESSING COMPLIANCE WITH REGULATION 6.1.1 OF CHAPTER II-2 OF THE 1974 SOLAS CONVENTION AND REGULATION 81(1) OF THE 1977 TORREMOLINOS CONVENTION

7.1 The above regulations require that extinguishers have a fire extinguishing capability at least equivalent to that of a 9ℓ fluid extinguisher. At present there are no standard test methods of determining this. The commonly accepted minimum sizes for other types of extinguishers are as follows:

Dry powder	4.5 kg
Carbon dioxide	3 kg

Larger units may be required dependent upon the potential fire hazards in the protected spaces. Care should also be taken to ensure that the quantity of extinguishing medium released in small spaces does not endanger personnel.

8 MARKING OF EXTINGUISHERS

8 1 Each extinguisher should be clearly marked with the following minimum information:

.1 Name of the manufacturer

.2 Types of fire for which the extinguisher is suitable

.3 Type and quantity of extinguishing medium

.4 Approval details

.5 Instructions for use and recharge. (It is recommended that operating instructions be pictorial.)

.6 Year of manufacture

.7 Temperature range over which the extinguisher will operate satisfactorily

.8 Test pressure

9 PERIODICAL INSPECTIONS AND MAINTENANCE

9.1 Extinguishers should be subject to periodical inspections and maintenance in accordance with the manufacturer's instructions. The periods between such inspections and maintenance should not exceed the period between safety equipment surveys.

9.2 Records of inspections should be maintained. The records should show the date of inspection, the maintenance performed, and whether or not a pressure test was performed.

9.3 Instructions for recharging extinguishers should be supplied by the manufacturer and be available for use on board.

ANNEX

	TYPES OF EXTINGUISHER							
	Water			Chemical foam	Mechanical foam	Powder	Carbon dioxide	Halogenated hydrocarbons
The extinguishing medium of the extinguisher:	Water, with possible salts in solution		Basic water solution	Basic water solution with foam generating substances	Water solution containing foam generating substances	Dry chemical powders	Pressurized carbon dioxide	Halogenated hydrocarbons
The expellant charge of the extinguisher (stored pressure or cartridge as indicated).	One basic and one acid reagent; in general the basic reagent is a solution of sodium bicarbonate and the acid reagent is a solution of sulphuric or hydrochloric acid or of aluminium sulphate	Carbon dioxide or other pressurized inert gas	Solution of sulphuric or hydrochloric acid or aluminium sulphate	Water solution and acid reagent (e.g. solution of aluminium sulphate)	Compressed air (or other pressurized inert gas)	Carbon dioxide or other inert gases or air (stored pressure or separate cartridge)	–	–
The discharge of the extinguisher is achieved by:	"Opening of the stop valve". Generation of carbon dioxide (chemical reaction which develops inside the cartridge)	"Opening of the stop valve". Action of pressurized gas (opening of bottle-type cartridge)	"Opening of the stop valve". Generation of carbon dioxide (chemical reaction between the acid in the cartridge and the basic solution of the charge)	"Opening of the stop valve". Generation of carbon dioxide (chemical reaction between the acid solution in the cartridge and the basic solution of the charge)	"Opening of the stop valve". Action of pressurized gas (opening of bottle-type cartridge)	"Opening of the stop valve". Expansion of the pressurized gas (opening of bottle-type cartridge)	Opening of the stop valve of the container constituting the extinguisher	Opening of the stop valve of the container constituting the extinguisher
The discharged extinguishing medium consists of:	Water with possible salts in solution		Water with salts in solution	Foam containing carbon dioxide	Foam containing the gas used	Dry chemical powders and carbon dioxide or other gas	Carbon dioxide	Halogenated hydrocarbons
The discharged extinguishing medium causes the extinction of fire by:	Cooling of the burning materials. Water evaporation and consequent formation of a local inert atmosphere (water steam) which isolates the burning products from the surrounding air			Formation of a foam layer which isolates the burning products from the surrounding air		Inhibition of the combustion process by interrupting the chemical reaction. Some separation of burning materials from surrounding air	Formation of a local inert atmosphere (carbon dioxide) which isolates the burning materials from the surrounding air. Smothering and cooling action of carbon dioxide	Inhibition of the combustion process

	TYPES OF EXTINGUISHER							
	Water			Chemical foam	Mechanical foam	Powder	Carbon dioxide	Halogenated hydrocarbons
The electrical resistance of the discharged extinguishing medium is:	Very low	Very low	Very low	Low	Low	Very high	Very high	Very high
Operating peculiarities and limitations:	The jet of the extinguisher is to be directed towards the base of the fire			The extinction of the fire is achieved only when all the burning surface is blanked by foam.		Powder mixture subject to windage; they therefore have limited effectiveness in the open or in ventilated spaces.	Gas, subject to windage; they therefore have limited effectiveness in the open or in ventilated spaces.	Gas, subject to windage; therefore, they have limited effectiveness in the open or in ventilated spaces. Caution should be used in selection of type of halon and size of unit if used in accommodation spaces. Avoid use in small enclosed spaces.
Disadvantages and dangers:	Not to be used on electrical hazards				Malfunctioning of the reducing arrangements may result in dangerous overpressures.	Generated powder mixtures are suffocating. Powder can damage electrical contacts.	Carbon dioxide is suffocating.	Some halogenated hydrocarbons are toxic either by themselves or by pyrolysis.
Maintenance:	Extinguishers with copper or copper alloy body should not be polished with products of corrosive nature which may cause wall thickness reduction. Such extinguishers should be preferably painted externally.					Some types of powder may be altered by humidity therefore, avoid the installation of the extinguisher in humid locations. Under intense heat, some powders may be electrically conductive.		
	The charge can freeze at temperatures of about 0°C (unless the charge is made non-freezable chemically).			The charge can freeze at about −5°C. The charge can be altered by elevated temperatures (about 40°C or more). Therefore, the extinguisher should not be installed in positions where it may be exposed to high or low temperatures.				
		Avoid installing the extinguisher in excessively warm locations, where the internal pressure of the carbon dioxide in the small bottle might rise to very high values.				When a carbon dioxide bottle is provided, avoid the installation of the extinguisher in excessively warm locations, where the internal pressure of the carbon dioxide in the bottle might rise to very high values.		